WHAT IS CLAIMED IS:

1. A method for fabricating a semiconductor device using a dry etching apparatus having a dual power source capable of independently controlling source power for generating a plasma in a chamber and bias power for drawing ions from the plasma into an object to be etched in the chamber, the method comprising the steps of:

forming a mask pattern having an opening corresponding to a region to be formed with an isolation on a silicon substrate;

placing the silicon substrate formed with the mask pattern in the chamber;

introducing a process gas containing at least oxygen into the chamber in which the silicon substrate has been placed; and

forming a trench for isolation in the silicon substrate by generating a plasma of the process gas with application of the source power, drawing ions from the plasma into the silicon substrate with application of the bias power, and thereby performing etching with respect to the silicon substrate,

the step of forming the trench for isolation including the step of generating the plasma by initiating the application of the bias power before oxidization proceeds at an exposed portion of the silicon substrate.

2. The method of claim 1, wherein the step of forming the trench for isolation includes the step of initiating the application of the bias power before initiating the application of the source power.

3. The method of claim 1, wherein the step of forming a trench for isolation includes the step of applying the source power and the bias power such that an effective value of the source power. reaches a second predetermined value after an effective value of the bias power reaches a first predetermined value.

4. A method for fabricating a semiconductor device using a dry etching apparatus having a dual power source capable of independently controlling source power for generating a plasma in a chamber and bias power for drawing ions from the plasma into an object to be etched in the chamber, the method comprising the steps of:

forming a conductive film containing at least silicon on a substrate;

forming a mask pattern covering a region to be formed with a gate electrode on the conductive film;

placing the substrate formed with the conductive film and with the mask pattern in the chamber;

introducing a process gas containing at least oxygen into the chamber in which the substrate has been placed; and

forming a gate electrode composed of the conductive film by generating a plasma of the process gas with application of the source power, drawing ions from the plasma into the conductive film with application of the bias power, and thereby performing etching with respect to the conductive film,

the step of forming the gate electrode including the step of generating the plasma by initiating the application of the bias power before oxidization proceeds at an exposed portion of the conductive film.

5. The method of claim 4, wherein the step of forming the gate electrode includes the step of initiating the application of the bias power before initiating the application of the source power.

6. The method of claim 4, wherein the step of forming the gate electrode includes the step of applying the source power and the bias power such that an effective value of the source power reaches a second predetermined value after an effective value of the bias power reaches a first predetermined value.

7. The method of claim 4, wherein the conductive film is a polysilicon film, an amorphous silicon film, or a silicide film.

8. A method for fabricating a semiconductor device by using a dry etching apparatus having a dual power source capable of independently controlling source power for generating a plasma in a chamber and bias power for drawing ions from the plasma into an object to be etched in the chamber, the method comprising the steps of:

performing etching with respect to the member by placing a substrate having a member containing at least silicon exposed thereat in the chamber, introducing a first process gas into the chamber, generating a first plasma of the first process gas with application of the

source power, and drawing ions from the first plasma into the member with application of the bias power;

exhausting the first process gas from the chamber after the step of performing etching with respect to the member and then introducing a second process gas containing at least oxygen into the chamber, while leaving the substrate in the chamber;

oxidizing a damaged layer formed in the member in the step of performing etching with respect to the member by generating a second plasma of the second process gas by applying the source power without applying the bias power; and

removing the oxidized damaged layer by retrieving the substrate from the chamber and cleaning the substrate.

9. The method of claim 8, wherein the member is a silicon substrate, the step of performing etching with respect to the member includes the step of forming a trench for isolation in the silicon substrate, and the step of oxidizing the damaged layer includes the step of oxidizing the damaged layer formed in portions of the silicon substrate located adjacent wall and bottom surfaces of the trench for isolation.

10. The method of claim 8, wherein the member is a conductive film formed on the substrate and containing at least silicon, the step of performing etching with respect to the member includes the step of forming a gate electrode composed of the conductive film on the substrate, and the step of oxidizing the damaged layer includes the step of oxidizing the damaged layer formed in a side surface of the gate electrode.

11. The method of claim 10, wherein the conductive film is a polysilicon film, an amorphous silicon film, or a silicide film.

12. A method for fabricating a semiconductor device by using a dry etching apparatus having a dual power source capable of independently controlling source power for generating a plasma in a chamber and bias power for drawing ions from the plasma into an object to be etched in the chamber, the method comprising the steps of:

placing a silicon substrate formed with a trench for isolation in the chamber;

introducing a process gas containing at least oxygen into the chamber in which the silicon substrate has been placed;

forming a silicon oxide film by generating a plasma of the process gas by applying the source power without applying the bias power and thereby oxidizing portions of the silicon substrate located adjacent wall and bottom surfaces of the trench for isolation; and

forming an isolation by retrieving the substrate from the chamber and filling an insulating film in the trench for isolation formed with the silicon oxide film.

13. The method of claim 12, wherein the. step of forming the isolation includes the step of forming the insulating film on the silicon substrate such that the trench for isolation is completely filled with the insulating film, planarizing a surface of the silicon substrate including a surface of the insulating film by CMP, and thereby removing a portion of the insulating film located externally of the trench for isolation.